1 March 2010

Comments by Kenneth Orth on
Proposed National Objectives, Principles and Standards for
Water and Water and Related Resources Implementation Studies
December 3, 2009

My comments address ideas about two concerns: saving lives and nonstructural planning. They are prompted by the adverse effects of Federal water resources projects on people during Hurricane Katrina, and the decades-long failure of Federal water resource agencies to engage in meaningful and required nonstructural planning. I believe that if the Council on Environmental Quality embraces the changes in these comments, the American people will be delightfully surprised by the Federal agencies' enthusiasm and creativity in planning and implementing nonstructural solutions that can both solve the Nation's water resources problems and truly protect the lives of our citizens.

Federal planning for flood control, flood damage reduction, and now flood risk management has been driven by economics and the maximization of net benefits, with adverse environmental effects being mitigated to the extent required for projects to go forward. But what, if any, accounting has similarly commonly been made of the effects of Federal water policy and projects on human life? Even basic estimates of the number of lives that could be saved or lost both with and without a project are not routinely, if ever, reported. But just as water projects undoubtedly save lives, the unthinkable can, does, and will again happen when projects fail to protect people's lives. We need look no further than the previous Administration's report *The Federal Response to Hurricane Katrina: Lessons Learned* (The White House, February 2006) for a stark assessment of the failure of traditional structural Federal water projects:

> "New Orleans flooded as the levees and floodwalls gave way and the pumping stations stopped operating; at its height, approximately 80 percent of New Orleans was filled with water up to twenty feet deep. This unprecedented flooding transformed Hurricane Katrina into a catastrophe within a catastrophe as the storm shattered the lives of countless residents and presented State and local officials with challenges far exceeding their capabilities."
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> "When the winds and floods of Hurricane Katrina subsided, an estimated 1,330 people were dead as a result of the storm. The vast majority of the fatalities - an estimated 80 percent - came from the New Orleans metropolitan area."
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> "By any measure, Hurricane Katrina was a national catastrophe. Similar to the images of grief and destruction on September 11, 2001, the images of suffering and despair from Hurricane Katrina are forever seared into the hearts and memories of all Americans. Those painful images must be a catalyst for change."

Breaching and overtopping of levees and floodwalls and the loss of hundreds of lives during Katrina should have been a wake-up call for changes in Federal water resources policy and planning. We must ensure that human life is treated with at least the importance given to economic and environmental costs and benefits in making decisions about Federal water projects. This revision of the *Principles and Guidelines* is an opportunity to do just that. So far, however, the Katrina failures are the obvious problem still too uncomfortable to address.

And yet, a just as obvious way forward is to finally take nonstructural planning seriously. Nonstructural solutions remove people and property from harm's way, reducing if not eliminating threats to life and property damages. And, for at least the last four decades, the Federal water resource agencies have been operating under numerous Federal laws, executive orders, and government-wide and agency regulations that require them to include nonstructural solutions in their planning to solve flooding problems. For example, the *Water Resources Development Act of 1974*, Section 73(a), states:

> "In the survey, planning, or design by any Federal agency of any project involving flood protection, consideration shall be given to nonstructural alternatives to prevent or reduce flood damages including, but not limited to, floodproofing of structures; flood plain regulation; acquisition of flood plain lands for recreational, fish and wildlife, and other public purposes; and relocation with a view toward formulating the most economically, socially, and environmentally acceptable means of reducing or preventing flood damages."

Additional Federal nonstructural planning requirements are attached for your reference.

These laws and regulations require evaluations, descriptions and consideration of nonstructural measures in Federal water resources planning, seemingly with the intent of formulating and recommending nonstructural projects. It is, by now, reasonable to expect that they would have yielded abundant results and numerous nonstructural projects would have been implemented, producing a wide range of benefits. Federal agencies to be covered by these *Principles and Guidelines* should be proud of their nonstructural planning and could do the American public a service by providing a catalog of their nonstructural accomplishments. In the absence this information it seems there are far too few Federal nonstructural projects that we can look to as examples of success, at least in part because the current body of Federal requirements for nonstructural planning have been ineffectual in producing them.

In the absence of evidence that Federal agencies have abided by decades of laws and requirements for nonstructural planning, and more importantly, given the unacceptable human consequences of future failures of traditional structural projects, it is time for a change in Federal water resources policy that will make a difference for the better in the lives, livelihoods and environment of the American people. These *Principles and Guidelines* provide an opportunity to make such real change. In that spirit, I recommend the following:

<u>List Nonstructural Measures</u>

The *Principles and Guidelines* should direct a single Federal agency, such as the Council on Environmental Quality or the Federal Emergency Management Agency, to prepare a list of nonstructural measures to be used in developing water resources projects. The list will:

- Be based on the experience and practices of Federal, State, Tribal and local agencies, interest groups, universities, expert consultants and the public.
- Cover all agency water resource mission areas, including but not limited to flood risk management, navigation, hydropower, water supply, water quality, and ecosystem restoration.
- Clearly state that ring levees, setback levees and the like are structural - not nonstructural - measures.
- Include a procedure to add and modify measures as the art and science of nonstructural planning advances.
- Be peer reviewed.

- Be published as a supporting procedure for these *Principles and Guidelines*.
- Be used to determine if an alternative is a nonstructural alternative.

Get Assistance for Nonstructural Planning

The Council on Environmental Quality's *Regulations For Implementing the Procedural Provisions Of The National Environmental Policy Act* (November 29, 1978, 40 CFR 1500-1508) recognize that Federal agencies have unique knowledge, skills and capabilities based on their jurisdictions by law and by their special expertise. Under these regulations, when lead planning agencies need to enhance their interdisciplinary capabilities they are to request the assistance of other cooperating agencies that already have the needed special expertise. Cooperating agencies must participate in the lead agencies' processes and develop information where they have special expertise to do so. Cooperating agencies are to use their own funds for such assistance, and lead agencies are to fund such assistance to the extent available funds permit (40 CFR 1501.5-1501.6).

The mission of the Federal Emergency Management Agency (FEMA) "is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.". FEMA oversees several grant programs that address flood problems commonly also addressed by the Federal water resource agencies covered by these *Principles and Guidelines*:

- The Hazard Mitigation Grant Program (HMGP; authorized under Section 404 of the *Robert T. Stafford Disaster Relief and Emergency Assistance Act*) may be "used to fund projects that will reduce or eliminate the losses from future disasters. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Examples of projects include, but are not limited to:
    - "Acquisition of real property for willing sellers and demolition or relocation of buildings to convert the property to open space use.
    - "Retrofitting structures and facilities to minimize damages from high winds, earthquake, flood, wildfire, or other natural hazards.
    - "Elevation of flood prone structures.
    - "Development and initial implementation of vegetative management programs.
    - "Post-disaster building code related activities that support building code officials during the reconstruction process."
- The Pre-Disaster Mitigation (PDM) Grant Program "provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations."
- The Flood Mitigation Assistance (FMA; created under *the National Flood Insurance Reform Act of 1994*) Program provides assistance in flood mitigation planning and the implementation of "measures to reduce flood losses, such as elevation, acquisition, or relocation" of structures.

(Quoted material from http://www.fema.gov/, accessed 21 January 2010)

Given FEMA's jurisdiction by law and special expertise in flood mitigation planning and implementation, these *Principles and Guidelines* should require the following for Federal planning for flood control, flood damage reduction, or flood risk management:

- Designate FEMA as a continuing cooperating agency for the lead Federal water resource agencies covered by these *Principles and Guidelines*, under the authority of 40 CFR 1501.5-1501.6.
- Require FEMA to participate in implementation studies covered by these *Principles and Guidelines* for the purpose of identifying and developing nonstructural measures and alternatives; participation may be through existing FEMA programs.
- Require Federal water resource agencies to enter into a memorandum of agreement with FEMA to fund their nonstructural planning activities, similar to the "Transfer Funding Agreement" among the U.S. Army Corps of Engineers, the U.S, Fish and Wildlife Service and the National Marine Fisheries Service.
- Direct FEMA to revise any internal regulations or seek additional authority that may be necessary to conduct nonstructural planning for other Federal agencies.

Consider Human Consequences

Project decision documents for Federal water resource projects routinely report a wide range of effects and impacts - beneficial and adverse - likely to result from the implementation of alternative plans. Project costs are estimated in dollars using elaborate cost estimating software applications; economic benefits are estimated based on detailed evaluation procedures included in the current (1983) *Principles and Guidelines* and agency regulations; effects on key fish and wildlife are presented in habitat units derived from biological models for selected species; and so forth. Agencies give us much information about the value of the contents of homes, the cost of construction rebar, the quality of fish spawning habitat, and the like. Yet rarely, if ever, do we see a Federal water project's potential effects on human lives presented with such clarity, precision and certainty.

Section 2033(d) of the *Water Resources Development Act of 2007* requires: "A feasibility study for a project for flood damage reduction shall include... a calculation of the residual risk of loss of human life and residual risk to human safety following completion of the proposed project."

Given the horrific consequences when Federal water projects fail, and in the interest of full disclosure and transparency, the *Principles and Guidelines* must require:

- Preparation and use of procedures to calculate the residual risk of loss of human life and residual risk to human safety following completion of a Federal water resources project. The procedures should:
    - Be prepared by the Council and used by the Federal water resource agencies covered by these *Principles and Guidelines*.
    - Cover all agency water resource mission areas, including but not limited to flood risk management, navigation, hydropower, water supply, water quality, and ecosystem restoration.
    - As a minimum, provide instructions for making calculations of the estimated number of lives likely to be lost as a result of: (1) construction and other implementation of a plan, (2) residual flooding and other remaining adverse conditions after implementation of a plan, including designed levee overtopping and similar intended, anticipated effects, and (3) physical failure of a plan, such as levee breaks, dam failure, and the like.

    - Be peer reviewed.
    - Be published as a supporting procedure for these *Principles and Guidelines*.
- In selecting a recommended plan, the agency decision maker should review a table displaying the effects on human lives of each plan in the final array of alternatives. For each plan, the table will display the estimated number of lives likely to be lost as a result of: (1) construction and other implementation of each plan, (2) residual flooding and other remaining adverse conditions after implementation of each plan, including designed levee overtopping and similar intended, anticipated effects, and (3) physical failure of the plan, such as levee breaks, dam failure, and the like. The agency decision maker will deliberately consider the effects on human lives in comparing alternative plans, and will sign and date the table when these effects have been considered. The table will be included in the agency's decision document. These requirements should be included in the standards for documentation and plan comparison in the final *Principles and Guidelines*.
- Agencies may disclose the estimated number of lives likely to be saved by their actions, but the final *Principles and Guidelines* should prohibit comparisons of lives lost and saved in the manner of a benefit-cost ratio or as net effects.

<u>Revise the Decision Rule</u>

The text under the heading "K. Recommend a Plan" (page 23, lines 18-44) is problematic:

- Paragraph (1)(b) is a reporting requirement, and based on a negative condition: explain yourself if you don't do something. This has nothing to do with making a decision but only telling a story after the fact. The threat of having to provide an explanation will inspire more creative writing than good nonstructural planning.
- What is the breakpoint where a primarily structural plan can become a primarily nonstructural plan (line 26)? Is it 49% structural and 51% nonstructural, or some other percentages? What is to be measured to determine "primarily": cost, square footage, tons of materials, or some other indicator?
- Paragraph (1)(c) is again another negative condition. The decision rule must be a positive statement: Select a plan that accomplishes something.
- Paragraph (2) need not repeat the decision rule (lines 35-36).
- "Environmental justice issues" (line 39; and as yet without practical meaning in the context of these *Principles and Guidelines*) must surely be by definition a Federal, State, Tribal and local concern and therefore need not be explicitly included here; otherwise you must include all similar issues to preclude the exclusion of others.

The decision rule is *the* opportunity in these *Principles and Guidelines* to assure the American people that the Federal water agencies understand fundamental change is necessary. Replace the text under the heading "K. Recommend a Plan" with the following:

> "(1) The Secretary or Independent Agency Head shall consider the final array of alternatives and recommend an alternative for implementation that:
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> "(a) Is a nonstructural alternative, and

"(b) Provides net combined beneficial effects for the Nation considering all significant monetary and non-monetary effects, both quantified and unquantified.

"(2) These conditions apply to recommendations for all agency missions and are not limited to alternatives for flood-related missions.

"(3) Where no nonstructural alternative meets these conditions, the Secretary or Independent Agency Head shall take the no action alternative (40 CFR 1502.14) and not recommend any other plan for implementation.

"(4) The Secretary or Independent Agency Head may grant an exception to these conditions if there are overriding reasons to recommend another alternative, including other Federal, State, Tribal, local and international concerns. Exceptions may be considered on a case-by-case basis; agencies may not grant blanket exceptions.

"(5) The basis for selection of the recommended plan shall be fully reported, including the criteria and other considerations used in the selection and the overriding reasons for any exception granted, to ensure the basis for the recommendation is fully transparent.

"(6) The following statement shall appear immediately above the agency decision maker's signature in the decision document and in the accompanying Record of Decision (40 CFR 1505.2):

> "I [name of agency decision maker] make this recommendation with the understanding that it poses a risk to human life, including a loss of [number] lives during construction and other implementation of the recommended Federal project, a loss of [number] lives from residual flooding, including any intended overtopping, and other remaining adverse conditions after implementation of the recommended Federal project, and a loss of [number] lives from the physical failure of the recommended Federal project."

This decision rule responds to the National Water Resource Policy set forth in Section 2031(a) of the *Water Resources Development Act of 2007*:

- Recommending a nonstructural plan responds to the Policy to "reflect national priorities, encourage economic development, and protect the environment by ... seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used." Nonstructural solutions remove people and property from harm's way, reducing if not eliminating adverse impacts and vulnerabilities.
- Providing net combined beneficial effects responds to the Policy, to "reflect national priorities, encourage economic development, and protect the environment by... seeking to maximize sustainable economic development...[and] protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems." How the Federal agencies are to measure and trade-off mixes of monetary and nonmonetary, quantified and unquantified, values is a longstanding problem and remains to be explained; but the intent of the requirement to do so is headed in the right direction.

This decision rule does not preclude Federal agencies from formulating and reporting on structural alternatives or alternatives that mix structural and nonstructural measures. It does, however, move a

decision to recommend projects that jeopardize lives and property from career bureaucrats and appointed officials to elected officials.

Selected Federal Requirements for Nonstructural Planning

"The planning process involves an evaluation of alternative means, including both structural and nonstructural measures, to achieve desired effects." (U.S Water Resources Council. *Principles and Standards for Planning Water and Related Land Resources*. September 10, 1973 (*Federal Register*, Volume 38, Number 174, page 24778+). Principles paragraph V.C)

"In the survey, planning, or design by any Federal agency of any project involving flood protection, consideration shall be given to nonstructural alternatives to prevent or reduce flood damages including, but not limited to, floodproofing of structures; flood plain regulation; acquisition of flood plain lands for recreational, fish and wildlife, and other public purposes; and relocation with a view toward formulating the most economically, socially, and environmentally acceptable means of reducing or preventing flood damages." (*Water Resources Development Act of 1974*, Section 73(a))

"Nonstructural measures should be considered as means for addressing problems and opportunities." (*Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*. March 10, 1983. Paragraph 1.6.1(f))

"In the case of any water resources project-related study authorized to be undertaken by the Secretary [of the Army], the Secretary shall prepare a feasibility report... The feasibility report shall also include...a description of a nonstructural alternative to the recommended plan when such plan does not have significant nonstructural features..." (*Water Resources Development Act of 1986*, Section 905 (a))

"At the request of a non-Federal interest for a flood control project, the Secretary [of the Army] shall conduct a reevaluation of a project authorized before the date of enactment of this Act to consider nonstructural alternatives..." (*Water Resources Development Act of 1999*, Section 219(b))

"Management measures are the building blocks of alternative plans and are categorized as structural and nonstructural. Equal consideration must be given to these two categories of measures during the planning process." (U.S. Army Corps of Engineers. *ER 1105-2-100, Planning Guidance*. April 22, 2000. Paragraph 2-3c(1)